

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

- 1 1. (Previously Presented) An apparatus for acknowledging a data transfer, comprising:
2 a processor configured to transfer data according to a plurality of protocols of a protocol
3 stack, the protocol stack comprising:
4 a first protocol layer to initiate a request for a data transfer; and
5 a second protocol layer to:
6 receive the request for the data transfer from the first protocol layer;
7 determine whether the request for the data transfer contains a request for
8 acknowledgement of completion of the data transfer;
9 send a performance request corresponding to the request for data transfer to a
10 third protocol layer; and
11 if the request for data transfer does contain a request for acknowledgement of the
12 completion of the data transfer, set a variable in memory to wait for an event corresponding to
13 the completion of the request for data transfer and send an acknowledgement to the first protocol
14 layer upon the occurrence of the event.
- 1 2. (Previously Presented) The apparatus set forth in claim 1, wherein the first protocol layer
2 is an internet small computer systems interface ("iSCSI") protocol layer.
- 1 3. (Previously Presented) The apparatus set forth in claim 1, wherein the second protocol
2 layer is an internet small computer systems interface extensions for remote direct memory access
3 ("iSER") protocol layer.
- 1 4. (Original) The apparatus set forth in claim 1, wherein the request for the data transfer
2 comprises an attribute that indicates the request for acknowledgement of completion of the data
3 transfer.

5. (Previously Presented) The apparatus set forth in claim 4, wherein a value of an error recovery level is notified to the second protocol layer from the first protocol layer.

6. (Previously Presented) The apparatus set forth in claim 1, wherein the third protocol layer is a remote direct memory access ("RDMA") protocol layer.

7. (Original) The apparatus set forth in claim 1, wherein the event relates to a zero length remote direct memory access ("RDMA") read completion.

8. (Currently Amended) A network arrangement, comprising:
a plurality of systems, at least one of the plurality of systems comprising a protocol stack and a process;
at least one input/output device;
a network that connects the plurality of systems and the at least one input/output device for communication; and
wherein the protocol stack comprises:
a first protocol layer to interact with a consumer;
a second protocol layer to:
receive a data exchange request from the first protocol layer, wherein the data exchange request is a request to initiate a data transfer;
examine the data exchange request to determine if an acknowledgement request is indicated;
send a performance request corresponding to the data exchange request to a third protocol layer; and
if the data exchange request contains the acknowledgement request, set a variable in memory to wait for an event that corresponds to [[the]]a completion of the performance request and send an acknowledgement to the first protocol layer upon the occurrence of the event.

1 9. (Previously Presented) The network arrangement set forth in claim 8, wherein the third
2 protocol layer interacts with the second protocol layer and the third protocol layer is to:
3 receive the performance request that corresponds to the data exchange request;
4 and
5 transmit a message to at least one of the plurality of systems and the at least one
6 input/output device via the network.

1 10. (Previously Presented) The network arrangement set forth in claim 9, comprising a remote
2 direct memory access network interface card ("RNIC") that is used by the protocol stack to
3 exchange the message between the at least one of the plurality of systems and the at least one
4 input/output device via the network.

1 11. (Previously Presented) The network arrangement set forth in claim 9, wherein the
2 message is a remote direct memory access ("RDMA") write message.

1 12. (Previously Presented) The network arrangement set forth in claim 9, wherein the
2 message is a zero length remote direct memory access ("RDMA") read message.

1 13. (Previously Presented) The network arrangement set forth in claim 8, wherein the second
2 protocol layer is an internet small computer systems interface extensions for remote direct
3 memory access ("iSER") protocol.

1 14. (Currently Amended) The network arrangement set forth in claim 8, wherein the data
2 exchange request comprises an attribute and data, the attribute for indicating the
3 acknowledgement request.

1 15. (Previously Presented) The network arrangement set forth in claim 8, wherein the process
2 operates according to a small computer systems interface protocol ("SCSI").

1 16. (Currently Amended) A method of acknowledging a data transfer, the method comprising:
2 transferring, by a processor, data according to a plurality of protocols;
3 receiving, from a first protocol layer by a second protocol layer, a request for initiating a
4 data transfer;
5 determining, by the second protocol layer, whether the request for initiating the data
6 transfer contains a request for acknowledgement of completion of the data transfer;
7 sending, by the second protocol layer, a performance request corresponding to the request
8 for initiating the data transfer according to a third protocol layer; and
9 if the request for data transfer does contain a request for acknowledgement of completion
10 of the data transfer, the second protocol layer setting a variable in memory to wait for an event
11 corresponding to completion of the data transfer and sending an acknowledgement to the first
12 protocol layer upon the occurrence of the event.

1 17. (Previously Presented) The method set forth in claim 16, comprising defining the first
2 protocol layer as an internet small computer systems interface (“iSCSI”) protocol layer.

1 18. (Currently Amended) The method set forth in claim 16, comprising defining the second
2 protocol layer as an internet small computer systems interface extensions for a remote direct
3 memory access (“iSER”) protocol layer.

1 19. (Original) The method set forth in claim 16, comprising defining the event to relate to a
2 zero length remote direct memory access (“RDMA”) read message completion.

20. (Original) The method set forth in claim 16, comprising defining the event to relate to a remote direct memory access ("RDMA") write message completion.

21. (Previously Presented) The method set forth in claim 16, comprising establishing an error recovery level by the first protocol layer to indicate the error recovery level in the request for acknowledgement of completion of the data transfer.

22. (Currently Amended) An apparatus for acknowledging a data transfer, comprising:
a processor;
means executable on the processor for receiving a request for initiating a data transfer according to a first protocol;
means executable on the processor for determining whether the request for initiating the data transfer contains a request for acknowledgement of completion of the data transfer according to a second protocol;
means executable on the processor for sending a performance request corresponding to the request for initiating data transfer according to a third protocol; and
means executable on the processor for setting a variable in memory to wait for an event to correspond to the completion of the performance request and for sending an acknowledgement according to the first protocol upon the occurrence of the event if the request for initiating the data transfer does contain the request for acknowledgement of completion of the data transfer.

23. (Currently Amended) A computer storage medium storing a program for acknowledging a data transfer, the program executable on a processor node and comprising:

first protocol code for performing a first protocol stored on the computer storage medium for generating a request for initiating a data transfer; and

second protocol code for performing a second protocol stored on the computer storage medium for:

receiving the request for initiating the data transfer from the first protocol code;

determining whether the request for initiating the data transfer contains a request for acknowledgement of completion of the data transfer;

sending a performance request corresponding to the request for initiating data transfer to a third protocol code; and

setting a variable in memory to wait for an event ~~to correspond~~ corresponding to the completion of the performance request and sending an acknowledgement to the first protocol code upon the occurrence of the event if the request for data transfer does contain a request for acknowledgement of completion of the data transfer.

24. (New) The apparatus as set forth in claim 1, wherein the processor and first, second, and third protocol layers are part of an initiator node to perform the data transfer with a target node.

25. (New) The method as set forth in claim 16, wherein the processor and first, second, and third protocol layers are part of an initiator node to perform the data transfer with a target node.